ECOREGIONS OF ONTARIO

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Ecological Land Classification Series, No. 26

ECOREGIONS OF ONTARIO

by
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1989

Sustainable Development Branch
Environment Canada

Ecological Land
Classification Series,
No. 26

Ecoregions of Ontario represents the 26th publication in the Ecological Land Classification Series published by the Sustainable Development Branch of Environment Canada. This series, initiated in 1976, has presented national standards, terminology, methodological examples, and perspectives for ecological land survey and classification in Canada. It has also been the publishing focus for reports by the various working groups of the Canada Committee on Ecological Land Classification.

BIBLIOGRAPHIC CITATION

Wickware, G.M. and C.D.A. Rubec. 1989a. Ecoregions of Ontario. Ecological Land Classification Series, No. 26. Sustainable Development Branch, Environment Canada. Ottawa, Ontario. 37 p.

Cat. No.: EN 73-3/26E
ISBN No.: 0-662-17303-1

TABLE OF CONTENTS

PREFACE

This report has been developed in support of a standardized approach to ecological land survey and classification in Canada. It represents the summary of a collaborative effort by scientists in several federal and provincial goverment departments (Environment Canada, Agriculture Canada, Forestry Canada, and Ontario Ministry of Natural Resources). The major portion of this work was undertaken by the senior author while with the Ontario Regional Office of Environment Canada.

Ecoregions of Ontario is a synthesis, and integration of a wide range of environmental information for Ontario within the national ecological data base framework developed by the Canada Committee on Ecological Land Classification since 1976. The text of this report presents synthesized descriptions of the ecoregions of Ontario. Descriptions of more detailed ecodistricts are presented in a separate map and descriptive table (Wickware and Rubec 1989b) included in an envelope on the inside back cover of this report.

Although the techniques used in deriving the mapping framework for this project are somewhat different from those used in earlier ecological and biophysical land classification studies, the form and substance of the units presented herein are, in fact, quite similar to previous work. Hence, it has been possible to draw on previously published and unpublished information and to integrate much of the old with much of the new, with the added benefit of now presenting Ontario ecological land classification within a national framework. The information presented here is consistent with numerous studies conducted in adjoining provinces of Canada. We believe this development will be of significant value to government authorities responsible for the management and conservation of our natural heritage.

E.B. Wiken
Chief
Ecological Applications Research

ACKNOWLEDGEMENTS

The preparation of this report involved the cooperation and assistance of a number of individuals and groups. Principal among these were:

- Keith Jones and Cliff Acton of the Ontario Institute of Pedology in Guelph who made available maps and documentation, in particular drafts of the "Soil Landscapes of Ontario" currently in preparation, and with whom ecoregion and soil landscape boundaries were reconciled;

- Geoffrey Pierpoint and Dys Burger formerly of the Ontario Ministry of Natural Resources with whom occurred many discussions over the years on the purpose and role of ecological land classification. Their efforts over the past 35 years, together with those of Angus Hills and other colleagues in the Ministry helped to make Ontario a leader in the development and application of ecological land classification throughout Canada;

- Anne Lucas who assembled much of the early descriptive information for ecoregions and undertook compilation.

- Paul Gray, Wildlife Branch, Ontario Ministry of Natural Resources; and Ed Wiken, Sustainable Development Branch, Environment Canada for suggestions and comments during the final revisions of this text.

INTRODUCTION

In 1979, the former Lands Directorate of Environment Canada initiated the national "Ecoregions of Canada" Project. This involved preparation of computerized data bases and maps of ecoregions and ecodistricts at various scales for the country including comprehensive environmental data descriptions for each mapped unit. This project formed part of an initiative to promote the application of an ecological approach to resource classification for planning, management and environmental impact assessment purposes in Canada in concert with the activities of the Canada Committee on Ecological Land Classification.

The Ecoregions of Canada Project also coincided early in 1980 with a national requirement to develop an ecological framework for the assessment of resources at risk due to the long range transport of air pollutants. Under terms of the Canada-United States Memorandum of Intent on Transboundary Air Pollution (Memorandum of Intent 1981), the Lands Directorate was required to initiate resources at risk evaluations and modelling. Mapping and distribution of landscapes sensitive to acidic deposition in eastern Canada subsequently used the ecodistrict framework for this purpose. This approach was later adopted and applied nationwide (Environment Canada 1988). Ecological frameworks such as that presented here continue to be sought to support conservation strategies, sustainable development initiatives, and state of the environment reporting (Pollard and McKechnie 1986; Science Council of Canada 1988).

Development of ecoregion and ecodistrict information strongly supported the objectives of the Canada Committee on Ecological Land Classification (CCELC). This included the development of an interdisciplinary, ecological approach to land survey and provision of nationally standardized terminology and classification. This interdisciplinary approach has since become known as "Ecological Land Survey (ELS)", wherein the landscape is conceived as ecosystems, large and small, nested within one another in a spatial hierarchy (Rowe and Sheard 1981; Rubec and Wiken 1983). Within this hierarchical concept of landscape evolved an integrated, ecological approach whereby resources are classified and mapped as ecosystems according to their

ecological unity (Thie et al. 1986). The classification process includes the description, comparison, and synthesis of data related to the biological and physical characteristics of the land (Rowe 1978), including parent material, landform, hydrology, vegetation, climate, and wildlife. The objective of an ELS is to map and describe ecologically distinct areas of the earth's surface at various levels of generalization, using biological and physical characteristics as defining criteria at each of the levels.

Seven levels of ELS generalization have been defined in Canada as presented in Table 1 (Environmental Conservation Service Task Force 1981; Wiken 1986). Since ELS is primarily a method of classification through mapping, remote sensing plays an important role in the process. Table 2 indicates the various remote sensing techniques appropriate to each level of classification (Rubec 1983; Thie et al. 1986).

It was within this context that preliminary work on the preparation of an ecoregion and ecodistrict data base for Ontario commenced in 1980. Initial maps and an extended legend were prepared as an open file report in 1983 by the Ontario regional unit of the Lands Directorate. In 1987, a review and update of the original project was undertaken with the objective of preparing a final report and map for the province.

The purpose of this report is to present the revised descriptions of ecoregions for Ontario. A map and summary table for biological and physical resources of ecoregions and ecodistricts are presented in Wickware and Rubec (1989b) at the back of this report. However, these data in essence, will never be "final", as on-going research and surveys continually gather new knowledge, permitting refinement or addition of more detail to what is presented here.

METHODOLOGY

BACKGROUND

Ecological land classification is not new to Ontario. During the 1950s and 1960s a major effort to develop a site classification for the province was undertaken by what was then known as the Ontario Department of Lands and Forests, under the direction of G. Angus Hills. Hills and his colleagues developed a hierarchical system which at the broadest level consisted of "site regions".

TABLE 1: Levels of Generalization for Ecological Land Survey Proposed by the Canada Committee on Ecological Land Classification (CCELC)

Definitions for the levels of generalization.

ECOZONE - an area of the earth's surface of very generalized, large ecological landscape units adjusting to the mix of distinctive and interrelated abiotic and biotic factors present at any given time.

ECOPROVINCE - an area of the earth's surface characterized by major structural or surface forms, faunal realms, vegetation, hydrological, soil and climatic zones.

ECOREGION - a part of an ecoprovince characterized by distinctive ecological responses to climate as expressed by vegetation, soils, water, and fauna.

ECODISTRICT - a part of an ecoregion characterized by a distinctive pattern of relief, geology, geomorphology, vegetation, soils, water, and fauna.

ECOSECTION - a part of an ecodistrict throughout which there is a recurring pattern of terrain, soils vegetation, water bodies, and fauna.

ECOSITE - a part of an ecosection having a relatively uniform parent material, soil and hydrology, and a chronosequence of vegetation.

ECOELEMENT - a part of an ecosite displaying uniform soil, topographical, vegetative and hydrological characteristics.

Sources: Environmental Conservation Service Task Force (1981), and Wiken (1986).

TABLE 2: Relationship Between Remote Sensing Systems and Some Ecological Land Survey Mapping Levels and Scales

Remote Sensing Sources	Ecological Land Survey Level and Mapping Scales I	II	III	IV	V
I Satellite Imagery	ECOREGION (1:3 000 000 to 1:1 000 000)				
II High Altitude Spacecraft or Aircraft Photography		ECODISTRICT (1:500 000 to 1:125 000)			
III Moderately High Altitude Aircraft Photography			ECOSECTION (1:250 000 to 1:50 000)		
IV Low Altitude Aircraft Photography				ECOSITE (1:50 000 to 1:10 000)	
V Low Altitude Aircraft and Ground Photography					ECOELEMENT (1:10 000 to 1:2 500)

Source: Rubec (1983); Thie et al. (1986).

Site regions are defined as "areas of land within which the response of vegetation to the features of landform follows a consistent pattern" (Hills 1959). In formulating the various site regions, Hills compared vegetation on similar landforms, and proceeded with the process of drawing a boundary between two site regions, each with a different vegetation succession on the same landform. In effect, the boundary between two site regions represents a line separating two regions with different effective climate. The result of this research was a subdivision of the province into a climatic grid where east-west lines represent a gradient of effective temperature from south to north, and north-south lines a gradient of effective humidity from east to west. Within the intersection of these lines a site region is formed.

Before refinement of the site region boundaries, however, it was first necessary to establish landform divisions, since site regions are meant to recognize the degree of variation existing between landform and vegetation both within each landform division and between adjoining divisions. These landform divisions are referred to as "site districts". Site districts possessing certain common landform-vegetation succession relationships are placed within the same site region.

Since site regions attempt to integrate all the landscape features within a prescribed area, and within a similar effective climate, they might also be referred to as "regions of potential biological productivity". Once established, site regions became integrated into the political-administrative framework of the province. Many provincial resource management and land use planning programs, particularly within the current Ontario Ministry of Natural Resources, have been, in part, based on this classification system. Over the intervening years, Hills and his colleagues continued to refine the site region boundaries as new information became available.

It was against this already well established history of land classification and research in Ontario that, in 1972, LANDSAT satellite data became available. This new and important technology for resource analysis provided, for the first time, a visual and synoptic overview of the earth's surface. Striking patterns of landforms, vegetation, geology, and hydrology were clearly evident and provided an ideal base for integrated classification and mapping of earth resources at small scales. The satellite images provided an effective and rapid technique for classifying land into ecologically distinct land areas which could later be refined as more detailed

information on the ecological relationships for each area became available. Ecological Land Survey at broad classification levels in the hierarchy (i.e. ecoregions and ecodistricts) could make effective use of this mapping tool. For those areas of Canada with limited environmental information, the use of LANDSAT imagery provided an important and effective information base. In Ontario, however, a classification system at the site region level was already in place and generally accepted. A large information base also already existed in southern Ontario; hence, it was essential that any new ecological land classification system, if it was to be of provincial significance and value, had to be as compatible as possible.

Soon after the Ontario component of the national ELS project was initiated, the Land Resource Research Centre (LRRC), of Agriculture Canada in Guelph, initiated a mapping and classification project entitled " Soil Landscapes of Ontario" (Acton 1982). Soil landscapes have been differentiated and mapped using terrestrial criteria including slope, landform, and mode of deposition of parent material. Mapping is at scales of 1:500 000 in southern and central Ontario, and 1:1 000 000 in northern Ontario. Soil landscapes are similar in concept to the ecodistrict level of ELS, in that landform, parent material and topography are essential variables for differentiating units. The project, which relies on existing soil and landform mapping, is effective in southern areas of the province where considerable mapping has been done. In northern Ontario, however, there is limited data; hence, differentiation of soil landscapes is more problematic. ELS provides a compatible and suitable soil landscape mapping framework for these northern areas.

Although there were a number of different groups pursuing land classification in the province, it was obvious that many of the objectives and rationale for each of the programs were similar and that some degree of integration at various mapping levels might be possible. The ecodistricts in the authors' accompanying map (Wickware and Rubec 1989b) reflect a coordinated effort among these groups to assist in the development of an integrated mapping framework. However, there is no suggestion that existing maps and data bases are now superseded by this map. The user of these data should, however, now be able to more easily reconcile map boundaries associated with each and, hence, facilitate the integration of information from each data base.

Currently, terrestrial ecoregion and ecodistrict boundaries are coincident with soil landscape polygon boundaries throughout the province. Ecoregion and site region boundaries are generally similar but not coincident to those presented in Hills (1976) and currently used by the Ontario Ministry of Natural Resources. Site region boundaries currently have their strongest relationship to a separate national land classification project -"Ecoclimatic Regions of Canada" (Ecoregions Working Group 1989) produced by the Canada Committee on Ecological Land Classification. These "ecoclimatic regions" are a direct refinement of Hill's site regions and are quite distinct from the "terrestrial ecoregions" described in this report.

PRELIMINARY DELINEATION

Although considerable resource information for the province is available, much of the data is concentrated south of 45°N latitude. Since published maps are oriented towards individual disciplines (i.e. soils, geology, and vegetation) mapping boundaries are not coincident, and are non-hierarchical and non-integrative. As LANDSAT provides a consistent and uniform base for mapping the entire province, and all resource sectors can be evaluated simultaneously in an integrated, ecological framework, it was decided to use LANDSAT as the mapping base (i.e. the ecological framework) for the ecoregions and ecodistricts of the province presented in this report and in Wickware and Rubec (1989b).

LANDSAT INTERPRETATION

Since LANDSAT portrays the biological and physical patterns of the landscape most effectively, ecodistricts were first delineated on LANDSAT images. A 1:1 000 000 scale LANDSAT mosaic of the province was used to delineate 79 ecodistricts. Each ecodistrict represents a pattern of hydrology (lakes and rivers), geology (lineaments), landforms, vegetation, land use, and topography. Single frame 1:1 000 000 scale LANDSAT scenes were then used to refine boundary delineations as appropriate. While the process used LANDSAT as the information base for boundary delineation, the experience and knowledge of the interpreter played a significant role, not only in deciding where boundaries were placed, but also in the size and extent of each delineation.

Once preliminary ecodistrict boundaries had been established, ecoregion boundaries were delineated. Since ecoregions can be considered as areas of

land characterized by a " distinctive ecological response to climate as expressed by the development of vegetation, soils, water, and fauna" (Rubec and Wiken 1983), it was decided to integrate the site region work of Hills (1976) and the more recent work on ecoclimatic regions into the process. Site region maps at a scale of 1:1 000 000 were prepared and subsequently overlayed onto the 1:1 000 000 scale LANDSAT mosaic (with delineated ecodistricts) and the various boundaries then compared. As LANDSAT was to provide the mapping framework, and coincident, hierarchical boundaries between ecoregions and ecodistricts were essential, site region boundaries were adjusted to follow ecodistrict boundaries. A comparison of the terrestrial ecoregions described in this report and the ecoclimatic regions of Ecoregions Working Group (1989), reveals that there is a substantial degree of comparibility.

REFINEMENT OF DELINEATION

Following initial delineation of ecoregions and ecodistricts, boundaries of the ecodistricts were subject to evaluation and refinement using the substantial data bases available for the province. It was not the intent to undertake a wholesale refinement of the interpreted LANDSAT mapping units, which is always a temptation when mapping units interpreted using a general data source and evaluated using data collected through more intensive methods. Rather, the goal was to refine boundaries where obvious anomalies in parent materials, landforms, topography, vegetation or hydrology existed between adjacent ecodistricts. Boundaries of units were correlated at the Ontario-Quebec and Ontario-Manitoba borders to be consistent wherever possible with published and unpublished ELS projects for those provinces, including Gilbert et al. (1985) and Wiken et al. (1989).

SOUTHERN ONTARIO DATA SOURCES

In southern Ontario, Chapman and Putnam (1973) was used extensively as a reference for landforms and surficial deposits, as were the many 1:50 000 and 1:250 000 soil survey maps published by Agriculture Canada for most of the area. Vegetation information was based on detailed work by Hills (1959, 1976), Ecoregions Working Group (1989), Rowe (1972), and Maycock (1979).

NORTHERN ONTARIO DATA SOURCES

In northern Ontario, 1:500 000 surficial geology maps of Zoltai (1965a, 1965b, and 1965c), Boissonneau (1965), Pala and Boissonneau (1980), and Bates

and Simlen (1969) were used extensively. In addition, 1:250 000 Ontario Land Inventory maps and 1:100 000 Northern Ontario Engineering Geology and Terrain Survey maps were available for most of northcentral Ontario, as well as parts of northern Ontario. The 1:100 000 and 1:250 000 soil landscape maps currently in preparation by Agriculture Canada in Guelph were also used in the final stages of refinement. Over the past ten years the senior author has participated in a number of forest site and ecological classification projects throughout northern Ontario. Efforts associated with this research provide a basis for much of the understanding of landform, soils and vegetation relationships in this part of the province.

DATA BASE DEVELOPMENT

Information collated from the various data sources has been compiled into a summary table for each of the ecodistricts, and organized by ecoregion. This summary table is presented in Wickware and Rubec (1989b).

THE ECOREGIONS OF ONTARIO

INTRODUCTION

A total of 17 ecoregions within Ontario have been recognized in this project (Figure 1). The Gods Plains Ecoregion along the Manitoba-Ontario border in the northwest, and the Hudson Plains Ecoregion along the Hudson Bay coast are extensions of units mainly occurring in Manitoba. Descriptions of these ecoregions are derived from Mills et al. (1976, 1978), and Dutchak et al. (1978). To the east, ecoregion boundaries merge with those delineated by co-workers at Environment Canada in Quebec as published in Gilbert et al. (1985). Unit names from Quebec are adopted for several ecoregions to be compatible with the national " Terrestrial Ecoregions of Canada" map currently in preparation (Wiken et al. 1989).

Ecoregions have been further subdivided into 79 ecodistricts (Table 3). A simple numbering system, starting in the southwest and ending in the northwest,

Cat. No.: EN 73-3/26E
ISBN No.: 0-662-17303-1

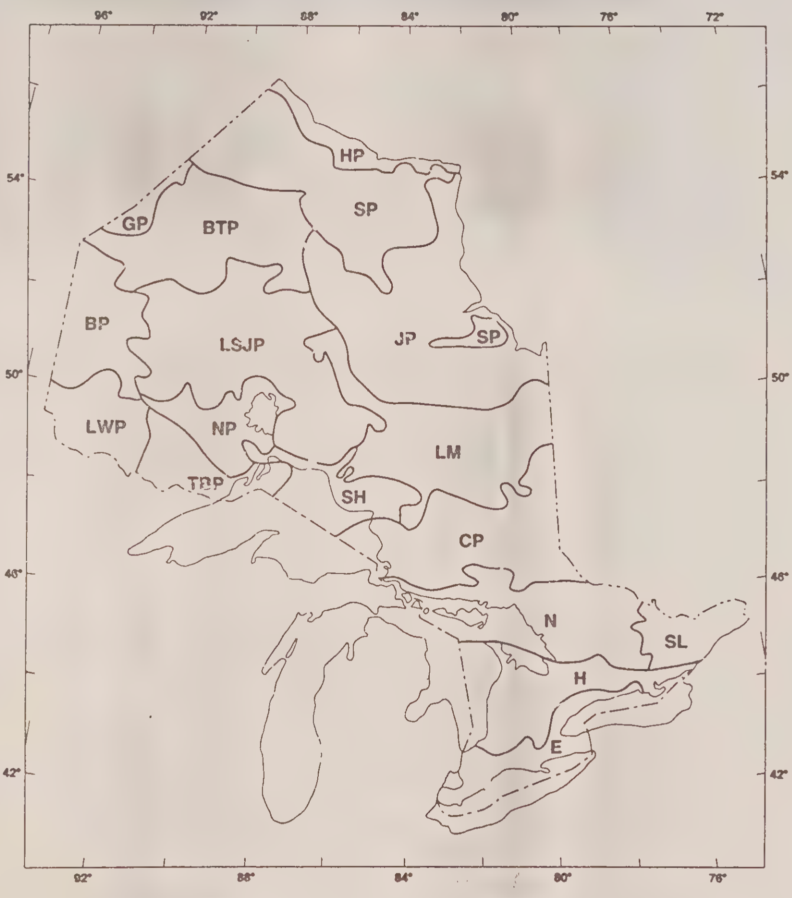

FIGURE 1: ECOREGIONS OF ONTARIO

BP - BERENS PLAINS
BTP - BIG TROUT PLAINS
CP - CHAPLEAU PLAINS
E - ERIE
GP - GODS PLAINS
H - HURONTARIO
HP - HUDSON PLAINS
JP - JAMES PLAINS
LM - LAKE MATAGAMI
LSJP - LAKE ST. JOSEPH PLAINS
LWP - LAKE-OF-THE-WOODS PLAINS
N - NIPISSING
NP - NIPIGON PLAINS
SH - SUPERIOR HIGHLANDS
SL - SAINT-LAURENT
SP - SPECTOR PLAINS
TBP - THUNDER BAY PLAINS

TABLE 3: Ecoregions and Ecodistricts in Ontario

Ecoregion Name	Ecodistrict Numbers*
Erie	1-4
Hurontario	5-13
Nipissing	14-18
Saint-Laurent	19-20
Chapleau Plains	21-24
Superior Highlands	25-26
Lac Matagami	27-33
James Plains	34-36, 38-42
Lake St. Joseph Plains	43-47
Nipigon Plains	48-50
Thunder Bay Plains	51-52
Lake of the Woods Plains	53-55
Berens Plains	56-58
Big Trout Plains	59-61
Spector Plains	37, 62-68, 70, 72-74
Hudson Plains	69, 71
Gods Plains	75-79

* See map and summary table in Wickware and Rubec (1989b) at the back of this report.

has been used for the ecodistricts while geographic names have been used for the ecoregions. A concise description for each of the ecoregions is presented in the following sections of this report. Numbers of each ecodistrict refer to those presented in Wickware and Rubec (1989b).

ERIE ECOREGION

Climate

Humid, warm to hot summers with mean daily temperatures in excess of 0°C for 8 to 9 months (April to November). Mean daily temperatures (such as 9.1°C in the Windsor area) in the western end of the ecoregion are slightly higher than in the central and eastern sections (7.4°C in the Toronto area for example). Winters are mild and snowy with monthly precipitation averaging 75 mm. Annual precipitation varies across the ecoregion being approximately 850 mm in the west, 760 mm in central areas, and 840 mm in the east. Precipitation is relatively evenly distributed throughout the year, with rainfall accounting for 75% of the total.

Terrain

The southwestern section of the Erie Ecoregion is dominated by a very weakly broken, bevelled clay moraine plain and a weakly broken, sand plain along the central portions of Lake Erie. Between the eastern end of Lake Erie and the western end of Lake Ontario a large, poorly drained and weakly broken, lacustrine clay plain dominates. The eastern section of the ecoregion along Lake Ontario is characterized by a drumlinized and bevelled clay moraine plain which is weakly broken in the northern sections and weakly to moderately broken along the shores of Lake Ontario. The Niagara Escarpment along the western end of Lake Ontario is the most striking geological feature of the ecoregion.

Soils

Soils on fresh to moderately well drained sites are generally classified as Gray Brown Luvisols; while Humic Gleysols and Organic soils characterize the imperfectly and poorly drained sites.

Vegetation

Sugar maple (Acer saccharum), beech (Fagus grandifolia), white oak (Quercus alba), red oak (Quercus rubra), and shagbark hickory (Carya ovata), together with black walnut (Juglans nigra) and butternut (Juglans cinerea) occur on fresh, well drained sites. Imperfectly drained sites are characterized by white elm (Ulmus

americana), eastern cottonwood (Populus deltoides), balsam poplar (Populus balsamifera), red ash (Fraxinus pennsylvanica), black ash (Fraxinus nigra), and silver maple (Acer saccharinum). Carolinian species such as tulip tree (Liriodendron tulipifera), sycamore (Platanus occidentalis), bitternut hickory (Carya cordiformis), chestnut oak (Quercus prinus), and dwarf chinquapin oak (Quercus prinoides), are also found in the ecoregion.

Land Use/Settlement

Most of the Erie Ecoregion is under intensive agriculture and produces such crops as grains, grapes, corn, tobacco, fruits, and vegetables. The ecoregion, composed of ecodistricts 1 to 4, is heavily urbanized and dominated by the large urban-centred regions of Metropolitan Toronto, Hamilton, and Windsor.

HURONTARIO ECOREGION

Climate

Warm summers and mild winters are characteristic of this ecoregion. Mean daily temperatures in excess of 0°C extend from April to November. Monthly precipitation usually exceeds 65 mm and is evenly distributed throughout the year.

Terrain

The ecoregion is dominated in the western section by weakly broken loamy and clay textured, drumlinized and undrumlinized morainal plains, and to the north, on the Bruce Peninsula, by a weakly broken to very weakly broken limestone plain with shallow loamy to clayey textured soils. The eastern sec. of the Hurontario Ecoregion is dominated by a weakly to moderately broken loamy, drumlinized morainal plain.

Soils

Soils of the ecoregion are typically Gray Brown Luvisols, and Melanic Brunisols on the fresh, well drained sites; Humo-Ferric Podzols on the drier, rapidly drained sites; and Gleysol and Organic soils on the poorly drained mineral and peaty sites.

Vegetation

Climax vegetation on fresh, well drained sites is typically sugar maple, beech, and eastern hemlock (Tsuga canadensis). Following disturbance eastern white pine (Pinus strobus), white birch (Betula papyrifera), and trembling aspen (Populus tremuloides) are common. Moister sites support stands of yellow birch (Betula lutea), white elm and red maple (Acer

rubrum). Dry sites are characterized by species such as red oak, eastern white pine, and red pine (Pinus resinosa). Wet sites support black spruce (Picea mariana), white spruce (Picea glauca), and balsam fir (Abies balsamea).

Land Use/Settlement

The Hurontario Ecoregion is largely rural, particularly in its northern sections where the growing of grains and corn and the raising of livestock are important economic activities. Recreational activities associated with the Niagara Escarpment, such as skiing, hiking, camping, and cottaging, and swimming, camping, and cottaging along the Lake Huron shoreline are also important economically.

In southern sections, a number of larger urban centres such as London and Barrie occur. Agriculture however, is the predominant economic activity with cash crops in areas such as the Holland/Bradford marshes being extremely important. The ecoregion incorporates ecodistricts 5 to 13.

NIPISSING ECOREGION

Climate

Warm summers with mean daily temperatures extending above-freezing occur from late March to December. Winters are cold and snowy with total snowfall varying across the Nipissing Ecoregion (290 mm in the east at (Algonquin Park); 195 mm in central areas at Sudbury). Mean annual temperatures also vary across the ecoregion, from 3.9°C in the Algonquin Park area to 4.8°C in the Sudbury area. Maximum rainfall occurs during September when almost 100 mm falls. Total rainfall across the ecoregion averages 620 mm.

Terrain

The ecoregion is dominated by a moderately broken to strongly broken, shallow to bedrock sandy loam morainal plain. Along Georgian Bay (Lake Huron) the terrain is more weakly to moderately broken with very shallow to bedrock soils. The ecoregion extends west along the north channel of Lake Huron where the terrain is characteristically moderately broken to weakly broken, with sandy-loamy-clayey lacustrine deposits occupying low lying areas among the bedrock hills.

Soils

Soils on dry, well drained sites are typically Humo-Ferric Podzols, with Gray Brown Luvisols, and Melanic Brunisols on the fresh, well to moderately well drained

resources at risk evaluations and modelling. Mapping and distribution of

whereby resources are classified and mapped as ecosystems according to their

sites. Gleysols on imperfectly drained sites and Organic soils in poorly drained depressions are typical.

Vegetation

Vegetation consists of tolerant hardwoods including sugar maple, yellow birch, eastern hemlock and eastern white pine on fresh to well drained sites. Dry, rapidly drained sites are characterized by red pine, eastern white pine, and red oak. Wetter, imperfectly drained sites support black ash, red maple, white spruce, tamarack (Larix laricina), and eastern white cedar (Thuja occidentalis).

Land Use/Settlement

Forestry, hydroelectric power generation, and tourism are the most important land use and economic activities in the Nipissing Ecoregion. Sudbury, North Bay, and Sault Ste. Marie are the largest urban centres in this rather sparsely populated ecoregion. Mining is important in the Sudbury Basin. The ecoregion incorporates ecodistricts 14 to 18.

CHAPLEAU PLAINS ECOREGION

Climate

The climate of this ecoregion is characterized by warm summers and cold winters. In the eastern section of the ecoregion (Kirkland Lake area), the mean annual temperature is 1.4°C while in the west (Chapleau area), the mean annual temperature is 2.2°C. Monthly precipitation ranges from 35 to 65 mm with maximum values occurring during the summer months. Shore sections along Lake Superior receive, on average, higher precipitation than the more inland areas of the ecoregion. Montreal River, for example, receives a total annual precipitation of approximately 900 mm, whereas Chapleau receives on average 834 mm and Kirkland Lake 855 mm.

Terrain

The Chapleau Plains Ecoregion is characterized by strongly broken to moderately broken topography in the shore sections along Lake Superior and by moderately to weakly broken topography in the central and eastern sections. Parent materials are sandy to loamy in the western Lake Superior shore sections, with frequent bedrock exposures and bedrock cliffs. Central sections of the ecoregion are characterized by sandy to loamy parent materials, often shallow to bedrock. In the extreme eastern section of the ecoregion, a weakly broken to very weakly broken lacustrine clay plain is locally dominant.

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Hills and his colleagues developed a hierarchical system which at the broadest level consisted of "site regions".

Soils

Soils in the rugged Lake Superior shore sections of the ecoregion are typically Humo-Ferric Podzols, often with well developed Ah horizons which develop under a hardwood forest canopy. Humo-Ferric Podzols are also dominant in the central sections of the ecoregion and develop under more typical boreal vegetation. Brunisolic Gray Luvisols and Gray Luvisols are found on sites with well drained clay deposits and dominate the eastern section of the ecoregion, while Gleysolic and Organic soils occupy imperfectly and poorly drained sites through the ecoregion.

Vegetation

Fresh, well drained sites of moderate relief are characterized by white spruce, balsam fir, eastern white pine, red pine, white birch, and trembling aspen. Along the Lake Superior shore sections, tolerant hardwoods such as sugar maple, red maple, and yellow birch occupy the fresh, well drained sites. Black spruce, tamarack, red maple, and black ash are commonly found on the imperfectly and poorly drained sites in the Lake Superior shore sections of the region, while black spruce, tamarack, and eastern white cedar are found on similar sites in other sections of the ecoregion. Jack pine (*Pinus banksiana*) and black spruce are found on dry, rapidly drained sites in the central and eastern sections of the ecoregion.

Land Use/Settlement

The ecoregion is sparsely populated, with most centres having less than 5 000 residents. The dominant economic activity is forestry and tourism. The ecoregion incorporates ecodistricts 21 to 24.

SUPERIOR HIGHLANDS ECOREGION

Climate

Warm summers, and long cold winters are typical of this ecoregion. Mean daily temperatures above 0°C occur from April through October except along Lake Superior where the period begins in March. Total annual precipitation varies only slightly across the ecoregion; inland the total is slightly higher (860 mm) than along the shore (840 mm). Most of the rainfall occurs during late summer (August to September); inland this amount ranges from 90 to 100 mm, with 80 to 90 mm along Lake Superior. Rainfall is approximately twice that of snowfall.

Terrain

The Superior Highlands Ecoregion is characterized by strongly to moderately broken topography covered by shallow, sandy to loamy moraine. Granitic bedrock outcrops in the form of rounded rock knobs and sheer cliff faces are common and occupy much of the landscape. In shore areas, these bedrock knobs have been exposed through the wave action of former glacial lakes in the ecoregion. Deep, glacially-eroded valleys near Lake Superior are frequently filled with sandy outwash deposits, varved lacustrine clay, or silt deposits.

Soils

Humo-Ferric Podzols and Dystric Brunisols are typically found under coniferous forest stands on dry to fresh, and rapidly to well drained sandy sites. Gray Luvisols occur where soils are finer textured (i.e. silts and clays), and Gleysols and Organic soils are present in poorly drained depressions or lower slope landscape positions.

Vegetation

Vegetation on fresh, well drained sites is characterized by boreal mixedwood stands of trembling aspen, white birch, white spruce, and balsam fir. Dry, well drained sites support pure stands of jack pine, and mixedwoods of jack pine, black spruce, trembling aspen and white birch. Wet and imperfectly drained sites are characterized by stands of black spruce, tamarack, and, occasionally, eastern white cedar. Thick mats of feathermoss (Hylocomium spp.) cover the forest floor under coniferous forest stands. On bedrock sites, this moss cover is frequently the only rooting medium for trees. Bedrock knobs are often covered by a stunted, discontinuous forest of jack pine with understory lichen mats.

Land Use/Settlement

The dominant land use and economic activity in the Superior Highlands Ecoregion is forestry. Mining of precious metals has recently become important with the discovery of gold in the Marathon-Hemlo area. Silver mining has been important historically, particularly in the Nipigon area, but is not significant today. The ecoregion incorporates two ecodistricts, 25 and 26, bordering Lake Superior.

THUNDER BAY PLAINS ECOREGION

Climate

Warm and somewhat dry summers and cold snowy winters are typical of this ecoregion. Daily temperatures above 0°C

occur from April to October with mean annual temperatures being slightly warmer near Lake Superior (2.3°C) than further inland (1.1°C). Precipitation is higher inland from the coast, averaging 724 mm in the Atikokan area. Along the shore, the average annual precipitation is 711 mm. Most of the precipitation is in the form of rainfall (approximately twice that of snowfall). In the interior of the ecoregion, there is a noticeable peak of moisture during the May to September period (75 to 105 mm per month). Distribution of moisture is somewhat more uniform in shore areas with monthly precipitation ranging from 75 to 90 mm.

Terrain

Shore areas are characterized by strongly to moderately broken topography with frequent bedrock exposures in the form of rock knobs and cliff faces. In the Nipigon area, and as far west as Thunder Bay, large geological structures called "mesas" occur where soft underlying sedimentary rocks are protected by a resistant overlaying cap of basaltic rock. Inland, the topography is moderately to weakly broken with a shallow, sandy-loamy surface morainal parent material. In the area west of Thunder Bay, deep silty-clayey lacustrine deposits occur as a result of inundation during glacial periods.

Soils

Humo-Ferric Podzols and Dystric Brunisols occur most frequently on the coarser textured, dry to fresh, rapidly to well drained sites. Gray Luvisols occur primarily on the finer textured silts and clays of the ecoregion. Gleysolic and Organic soils occur in poorly drained bedrock depressions and in imperfectly drained sites of finer textured material.

Vegetation

A number of species more typically found in the Great Lakes St. Lawrence Lowland Forest Region (Rowe 1972) occur in conjunction with the more usual boreal forest species of this ecoregion. Red maple, silver maple, and yellow birch of the Great Lakes Forest Region usually occur on slightly warmer sites and most commonly in the Thunder Bay area of the ecoregion. On fresh, well drained sites in other parts of the ecoregion, coniferous forests dominated by white spruce, balsam fir, trembling aspen, white birch and, occasionally, eastern white pine are typical. Dry, rapidly drained sites support stands of jack pine and jack pine-black spruce mixtures. On imperfectly and poorly drained sites, black spruce, tamarack, and balsam poplar are common. In the Thunder Bay area, these sites

referred to as "site districts". Site districts possessing certain common landform-vegetation succession relationships are placed within the same site region.

integrated classification and mapping of earth resources at small scales. The satellite images provided an effective and rapid technique for classifying land into ecologically distinct land areas which could later be refined as more detailed

frequently support black ash, eastern white cedar, and yellow birch.

Land Use/Settlement

Forestry and tourism are the main economic activities of the Thunder Bay Plains Ecoregion. Thunder Bay, the regional centre, is located at the head of the Great Lakes system and functions as a major transhipment point for western Canadian grain, as well as other products such as pulp and paper. This ecoregion incorporates two ecodistricts, 51 and 52.

NIPIGON PLAINS ECOREGION

Climate

Warm summers and cold snowy winters characterize this ecoregion. Mean annual daily temperatures range from -1.1°C in the northern sections of the ecoregion to 0.6°C in the western areas. Areas near Lake Nipigon shores are similar to those for Thunder Bay where mean daily temperatures are 2.3°C. Precipitation is unevenly distributed throughout the season with more than half falling as rain during the May to September period. Total annual precipitation in the northern portion is 738 mm, while in the west it is 798 mm.

Terrain

Weakly to moderately broken topography characterizes the Nipigon Plains Ecoregion. The area adjacent to Lake Nipigon is typically a weakly broken sandy plain with pockets of finer textured silty to clayey, lacustrine parent materials. To the north, in the Armstrong area, and to the west in the Upsala-Raith area, extensive plains of outwash sands and gravels occur. Dune fields have formed over many areas of these deposits. Much of the remaining central section of the ecoregion is characterized by sandy to coarse loamy textured deposits which overlie a weakly to moderately broken substrate. Frequent bedrock exposures and shallow to bedrock soils occur.

Soils

Humo-Ferric Podzols are associated with most coarser textured, well drained sites of the ecoregion. Gray Luvisols are associated with finer textured silts and clays of the Lake Nipigon area. Gleysolic and Organic soils are found on imperfectly and poorly drained bedrock depressions.

Vegetation

Vegetation in this ecoregion is character-

parent material. Mapping is at scales of 1:500 000 in southern and central Ontario, and 1:1 000 000 in northern Ontario. Soil landscapes are similar in concept to the

reconcile map boundaries associated with each and, hence, facilitate the integration of information from each data base.

ized by white spruce, balsam fir, jack pine, black spruce, trembling aspen, and white birch on fresh, well drained sites. White spruce and balsam fir are particularly suited to the finer textured materials in the Lake Nipigon area. Jack pine with lichen mats occurs on bare bedrock knobs. Shallow soil sites, prior to disturbance, are typically dominated by black spruce or mixed black spruce-jack pine stands. Following disturbance, a range of forest types may occur, including hardwood and softwood mixedwoods. Black spruce, tamarack, and balsam poplar occur on imperfectly and poorly drained sites. Extensive stands of jack pine occur on the coarse textured, fire-prone, glaciofluvial outwash deposits of the Armstrong and Upsala-Raith areas of the ecoregion.

Land Use/Settlement

Forestry for pulp and paper purposes is the most important economic activity in this sparsely populated ecoregion. Three ecodistricts, 48 to 50, make up the ecoregion.

LAKE ST. JOSEPH PLAINS ECOREGION

Climate

Warm summers, and long cold, snowy winters characterize this ecoregion. Mean annual daily temperatures vary little across the ecoregion. In the west, temperatures average -0.9°C, while in the east -0.4°C. Mean daily temperatures in excess of 0°C last up to seven months from April to October. Total annual precipitation varies significantly across the ecoregion, being approximately 700 mm in the eastern sections and 760 mm in the west. Rainfall levels are twice that for snowfall. In the west, precipitation patterns are slightly different as the moisture tends to occur mainly during the May to September period. In the east, moisture is more evenly distributed throughout the year, although less than 40 mm of water equivalent falls during the January to April period.

Terrain

The ecoregion is characterized by weakly to moderately broken topography. In the east, the terrain is undulating to rolling and covered by a shallow to moderately deep, sandy to coarse loamy textured moraine. Frequent bare bedrock knobs occur. Pockets of lacustrine silts and clays occur, particularly in the Geraldton-Longlac areas.

Deep lacustrine sands occur in the area north of Lake Nipigon. To the north, the ecoregion is covered by a weakly broken outwash sand plain, and a coarse loamy,

As LANDSAT provides a consistent and uniform base for mapping the entire province, and all resource sectors can be evaluated simultaneously in an integrated,

Once preliminary ecodistrict boundaries had been established, ecoregion boundaries were delineated. Since ecoregions can be considered as areas of

drumlinized morainal plain. In the west, the ecoregion is characterized by a weakly broken lacustrine clay plain, a remnant of Glacial Lake Agassiz.

Soils

Soils of the ecoregion are predominantly Humo-Ferric Podzols. Dystric Brunisols are found on coarse textured sites and Gray Luvisols on fine loamy-clayey sites. Gleysolic and Organic soils occur on imperfectly drained sites and in bedrock depressions. Peaty phase Gleysols are particularly predominant on the poorly drained clay sites of the Longlac-Geraldton area.

Vegetation

Fresh, well drained sites are characterized by stands of black spruce, white spruce, balsam fir, jack pine, trembling aspen, and white birch. On dry, rapidly drained, coarse textured sands, jack pine and jack pine-black spruce occur. Occasional stands of eastern white pine and red pine also occur. Stunted low density jack pine stands characterize the shallow soil bedrock sites. Black spruce, tamarack, and balsam poplar occur in bedrock depressions and poorly drained sites.

Land Use/Settlement

Forestry for pulp and paper and hydroelectric generation are the predominant economic activities in the ecoregion. The ecoregion incorporates ecodistricts 43 to 47.

LAC MATAGAMI ECOREGION

Climate

Warm summers, and cold snowy winters are typical of this ecoregion. Mean daily temperatures in excess of 0°C occur during the April to October period. There is little variation in mean daily temperatures across the ecoregion. In the east, the mean daily temperature is 0.5°C, while in the west is 0.2°C. Total precipitation varies significantly across the area, being 885 mm in the east (at Cochrane) and 735 mm in the west (at Hornepayne). Snowfall supplies less than half the total annual precipitation. Moisture distribution is fairly even across the ecoregion with 45 to 50 mm average during the winter months and 70 to 85 mm during the summer months.

Terrain

The Lac Matagami Ecoregion is predomi-

bases available for the province. It was not the intent to undertake a wholesale refinement of the interpreted LANDSAT mapping units, which is always a tempta-

in northern Ontario, 1:500 000 surficial geology maps of Zoltai (1965a, 1965b, and 1965c), Boissonneau (1965), Pala and Boissonneau (1980), and Bates

nantly an imperfectly to poorly drained, very weakly to weakly broken, glaciolacustrine clay plain. Surficial deposits were reworked during a late glacial readvance and redeposited as a clay moraine. The area was formerly part of Glacial Lake Barlow-Ojibway. Coarse sandy textured, glaciofluvial outwash deposits occur throughout the ecoregion but are particularly prominent in the southern and western sections of the ecoregion, providing some relief to this otherwise flat plain. Much of the area is covered by a blanket of peat with depths ranging from 3 to 4 meters.

Soils

Soils of the ecoregion are predominantly poorly drained Organic soils or imperfectly drained peaty phase Gleysols. Humo-Ferric Podzols occur on the well drained sandy sites, while Gray and Brunisolic Gray Luvisols occur on the better drained, fine loamy to clayey textured sites.

Vegetation

Extensive stands of black spruce occur on the thick deposits of peat which cover much of the ecoregion. On fresh, well drained, fine loamy and clayey deposits, white spruce, balsam fir, black spruce, and eastern white cedar occur. Jack pine, and jack pine-black spruce stands are common on the drier, rapidly drained, coarse textured sandy sites. Mixedwood stands of trembling aspen, white birch, black spruce, white spruce, and balsam fir occur on a wide range of disturbed sites.

Land Use/Settlement

Forestry, mining, and tourism are the primary economic activities in the Lac Matagami Ecoregion. Timmins is the largest population centre and supports a range of primary and secondary economic manufacturing endeavors. Smaller centres primarily support the forest industry. The ecoregion includes ecodistricts 27 to 33, several of which mainly occur in Quebec.

SAINT-LAURENT ECOREGION

Climate

Warm summers with mean daily temperatures above 0°C for 8 months (April to November), and cold, snowy winters with monthly precipitation averaging 75 to 80 mm characterize this ecoregion. Precipitation is relatively evenly distributed throughout the year and over the entire ecoregion. Total mean annual precipitation ranges from 875 to 925 mm, and

annual average temperature from 5.7 to 6.6°C.

Terrain

The Saint-Laurent Ecoregion is dominated in the north by the weakly broken to very weakly broken, poorly drained clay and sand plains of the Ottawa Valley. These deposits are associated with the post-glacial Champlain Sea. A large, very weakly to weakly broken, limestone plain with shallow soils occurs throughout the central part of the ecoregion (in the Smiths Falls area). An extensive weakly broken, very stony, morainal plain to the south stretches from the Prescott area east to the Quebec border. Long drumlinoid ridges with intervening clay flats are typical associated landscapes.

Soils

Poorly drained clay soils are generally Gray Brown Luvisols or Luvic Gleysols. On the coarser textured loamy morainal materials, soils are typically Melanic Brunisols or Humo-Ferric Podzols. These are sparse and profile development tends to be shallow. Organic soils occur frequently throughout the ecoregion and are typically associated with the poorly drained clay plains or depressions in morainal deposits.

Vegetation

Sugar maple, oak, beech and eastern hemlock occur on fresh, well drained sites, while white elm, ash, red maple, and eastern white cedar occur on shallow, imperfectly drained soils. Tamarack and black spruce occur on deep, poorly drained peat deposits. Eastern white pine, red pine, and red oak are typically found on drier sites.

Land Use/Settlement

Dairy farming and growing of crops such as alfalfa, oats, mixed grains, and silage corn are the major economic activities of the ecoregion. Ottawa is the largest urban centre. Two ecodistricts, 19 and 20, are incorporated in this ecoregion which extends eastward into Quebec along the St. Lawrence Lowlands.

SPECTOR PLAINS ECOREGION

Climate

Long cold winters and short cool summers are characteristic of this ecoregion. At the coastal settlement of Peawanuck (formerly called Winisk) north of this ecoregion, the mean annual temperature is -5.5°C, with a mean January temperature of -25°C and a mean July tem-

BP - BERENS PLAINS
BTP - BIG TROUT PLAINS
CP - CHAPLEAU PLAINS
E - ERIE
GP - GODS PLAINS
H - HURONTARIO
HP - HUDSON PLAINS
JP - JAMES PLAINS
LM - LAKE MATAGAMI

LSJP - LAKE ST. JOSEPH PLAINS
LWP - LAKE-OF-THE-WOODS PLAINS
N - NIPISSING
NP - NIPIGON PLAINS
SH - SUPERIOR HIGHLANDS
SL - SAINT-LAURENT
SP - SPECTOR PLAINS
TBP - THUNDER BAY PLAINS

perature of 11°C. Annual precipitation ranges from 455 to 755 mm, with a mean of 607 mm.

Terrain

The Spector Plains Ecoregion is part of the Hudson Bay Lowland, a distinct physiographic unit within the Hudson Platform, a large flat-laying geological structure comprised of 400 million year old early Paleozoic carbonate rocks. The ecoregion is bordered on the north by the Hudson Plains Ecoregion, and on the south by the Canadian Precambrian Shield. An outlying unit of this ecoregion occurs inland and southwest of Fort Albany. Elevation at the boundary of the Lowland and the Shield is approximately 200 m. From this contact, the elevation drops gradually and smoothly towards the sea with an average gradient of approximately 1 metre per kilometre. During the most recent glacial period the area experienced severe downwarping. Following deglaciation the ecoregion was inundated by the Tyrell Sea and covered by marine sediments. Over the past 8 000 years, the ecoregion has been undergoing gradual isostatic recovery which today is estimated to average approximately 1 m/100 years. The combination of a flat-laying geological structure, poorly drained marine silts and clays, immature drainage development, and severe climate (with low evapotranspiration) has resulted in an extensive wet, flat plain characterized by a complex of poorly drained peatlands and a myriad of small lakes, ponds, and creeks.

Permafrost has become established throughout most of the ecoregion. Peatland landform features characteristic of this permafrost terrain include palsas, peat plateau bogs, and lowland polygon fens and bogs. Peat depths are typically 2 to 3 m. Several small diabase outcrops, the largest in the vicinity of the Hawley-Sutton lakes area, provide the only major relief features of this otherwise flat, low lying peatland complex.

Soils

The ecoregion is characterized by Organic Cryosols and Typic/Terric Fibrisols or Mesisols. Except for a few bedrock outcrops the entire area is wet and poorly drained.

Vegetation

A wide range of physiognomic vegetation types occur throughout the ecoregion. Paludified beach ridges in the northern portions of the ecoregion are typically classified as "treed bogs" and dominated

by black spruce and lichen. Treed bogs also occur as domed peatland landforms which develop naturally in the ecoregion over time. Featureless black spruce-tamarack swamps with understories of swamp birch (Betula nana), sweet gale (Myrica gale), and leatherleaf (Chamaedaphne calyculata) extend over large areas of the ecoregion. Open bogs and fens dominated by Sphagnum species and shrubs such as leatherleaf, dwarf birch (Betula glandulosa), and black spruce also occur over extensive areas and are typically found on the patterned polygon peatlands of the interior.

Land Use/Settlement

The ecoregion is almost unpopulated with only a few small, scattered settlements. Winisk Wild River Provincial Park transects the ecoregion. There is little economic development with hunting, trapping and fishing by residents of the local communities being the primary activities. The ecoregion incorporates ecodistricts 37, 62 to 68, 70, and 72 to 74, several of which mainly occur in Manitoba.

HUDSON PLAINS ECOREGION

Climate

Long cold winters and short cool summers are characteristic of this ecoregion. At the coastal settlement of Peawanuck (Winisk) the mean annual temperature is -5.5°C, with a mean January temperature of -25°C, and a mean July temperature of 11°C. Mean annual precipitation is 607 mm at Peawanuck.

Climate variation is present across the ecoregion particularly along the Hudson Bay coast. During the summer period, coastal fog is common and related to tidal movements. However, the effect is local and extends inland only a few kilometers. On-shore winds during this period also result in cooler daily temperatures than those experienced further inland.

Terrain

The ecoregion is part of the Hudson Bay Lowland and is bordered on the north by the waters of Hudson Bay, and the south by the Spector Plains Ecoregion. From this southern contact, the elevation drops gradually and smoothly towards the sea with an average gradient of approximately 1 metre per kilometre. During the most recent glacial period the area experienced severe downwarping. Following deglaciation the ecoregion was inundated by the Tyrell Sea and covered by marine sediments. Over the past 8 000 years, the ecoregion has been undergoing gradual isostatic recovery which today is esti-

mated to average approximately 1 m/100 years.

The coastal area in the western section of the ecoregion is characterized by numerous, large, parallel, and well drained beach ridges associated with poorly drained inter-ridge swales. The beach ridges are sparsely vegetated near the coast and are extensively deflated. Further inland, the ridges and swales become increasingly covered with peat and are quickly paludified. Only the largest and highest of the beach ridges remain recognizable inland from the coast. Eastern near-coastal sections of the ecoregion have less well developed ridges and are characterized by extensive low and poorly drained tidal flats. Cape Henrietta Maria, at the junction of Hudson and James bays is characterized both by extensive tidal flats and well developed anastamosing beach ridges comprised of limestone shingle.

Soils

A range of soil conditions characterize the ecoregion. On the well drained coastal beach ridges, Orthic Regosols are typical. Inland on the ridges, Static or Turbic Cryosols develop initially and as the organic deposits increase in depth, Organic Cryosols or Typic/Terric Fibrisols or Mesisols develop. On the tidal flats, Humic Gleysols or Rego Gleysols are characteristic.

Vegetation

A wide range of physiognomic vegetation types occur throughout the ecoregion. Well drained, near coastal beach ridges are sparsely vegetated by a variety of low trailing shrubs and herbs which are able to withstand severe coastal winds and temperatures (Hedysarum mackenzeii, Honkeyna peploides, Salix arctica, Salix reticulata). Open canopied "lichen woodland" types develop on ridges slightly further inland and are characterized by white and black spruce in the tree layer, with various lichen and shrub species (Cladina rangiferina, Cladina mitis, Cladina stellaris, Empetrum nigrum, Arctostaphylos alpina, and Vaccinium uliginosum) in the understory. Paludified beach ridges in the southern sections of the ecoregion are typically classified as "treed bogs" and dominated by black spruce and lichen.

Salt marshes along the coast are dominated by salt tolerant species such as Puccinellia phryganodes, Carex subspathacea, and Hippuris spp. Immature coastal fens with relatively thin deposits of peat are characterized by sedges, and low shrubs.

Land Use/Settlement

The ecoregion is sparsely populated with only a few small, scattered settlements, such as Peawanuck and Fort Severn along the Hudson Bay coast. Hunting, trapping and fishing by residents of local communities are the primary economic activities. Much of the coastal lowland centred on Peawanuck lies within Polar Bear Provincial Park. Ecodistricts 69 and 71, which make up this ecoregion, both extend west and north into Manitoba.

JAMES PLAINS ECOREGION

Climate

Short, warm summers and long cold winters are characteristic of this ecoregion. The mean annual temperature at Moosonee in the southeast part of the ecoregion is -1.1°C. Mean daily temperatures greater than 0°C extend from May to October, with frost possible in all months. The frost free period is less than 70 days. Total annual precipitation is approximately 730 mm, most of which occurs as rainfall during the May to November period. Total annual rainfall is 501 mm; snowfall is 239 mm. Monthly precipitation is usually less than 40 mm during the winter months.

Terrain

The James Plains Ecoregion is similar to the Hudson and Spector Plains ecoregions in that it is also part of the Hudson Platform. The ecoregion is bounded on the west by the Canadian Shield, and on the east by the waters of James Bay. The terrain is flat, and poorly drained, being underlain by Tyrell Sea silts and clays. An average gradient of approximately 1 m per km and an immature drainage system are characteristic of the ecoregion.

Well drained, gravelly beach ridges parallel the coast and extend inland for hundreds of kilometers. Most ridges become paludified, however, and only the largest ridges remain recognizable. Peatland landforms such as domed bogs, patterned fens and bogs, and bog islands characterize the flat marine plain. Extensive tidal flats occur along most of the coast from the Quebec border to Akimiski Island. North from Akimiski Island, the tidal area is reduced and the prominence of coastal ridges increases. Several large morainal deposits occur in the ecoregion such as between the Harricanaw and Moose rivers. These are clearly recognizable on LANDSAT images. The deposits are paludified and have become part of the peatland

complex. Well drained alluvial silts occur along levees of major rivers in the ecoregion. These well drained conditions occur as narrow strips along the rivers, and quickly grade into poorly drained organic terrain beyond the immediate river areas.

Soils

Soils on well drained beach ridges near the coast are characteristically Orthic Regosols. Moving inland from the coast, Ferro-Humic Podzols or Dystric Brunisols develop, particularly on well developed ridges not yet paludified. Poorly developed soils also occur in coastal salt marshes with Orthic and Humic Gleysols being most typical. Poorly drained Organic soils (Typic/Terric Fibrisols and Mesisols) have developed throughout most of the ecoregion where peat depths are greather than 40 cm. Peaty phase Gleysols, Humic Gleysols, and Organic soils occur on major river levees such as those along the Harricanaw, Moose, Albany, Attawapiskat, and Ekwan rivers.

Vegetation

Black spruce-tamarack dominated treed swamps, and tamarack dominated treed fens are the most extensive wetland types of the ecoregion. Upland conifer forests of white and black spruce, and occasionally balsam fir, occupy the well drained beach ridges and river levees, while balsam poplar, and trembling aspen occur on the youngest of the near coastal beach ridges and along river levees near the coast. These upland deciduous forests also occur as an early successional forest phase following fire on prominent beach ridges or river levees inland from the coast. Treed bogs with black spruce, and open low shrub, graminoid, and Sphagnum moss bogs and fens also occur widely over the ecoregion.

Land Use/Settlement

Tourism and recreation are the predominant economic activities of the ecoregion. Moosonee and Moose Factory near the estuary of the Moose River are the most common destinations for hunters and fishermen, particularly in the fall during the waterfowl migration period. Moosonee, Fort Albany, and Attawapiskat are major settlements of the ecoregion. Ecodistricts 34 to 36, and 38 to 42 are incorporated in this ecoregion.

BIG TROUT PLAINS ECOREGION

Climate

Cool summers and long cold winters are characteristic of this ecoregion. The mean annual temperature in the northern

part of the ecoregion is -3.0°C at Big Trout Lake, while in the southeast it is -1.6°C at Lansdowne House. Mean daily temperatures above 0°C extend from May to October. Mean annual precipitation ranges from 580 mm in the northern sections of the ecoregion to 666 mm in the east. Monthly precipitation is unevenly distributed throughout the year with the June to October period averaging 75 mm to 80 mm, and the November to May period averaging 25 mm to 30 mm.

Terrain

Weakly broken topography characterizes the ecoregion. In the west, undulating rock ridges with pockets of calcareous lacustrine clays and non-calcareous sands associated with Glacial Lake Agassiz predominate. Rock ridges and shallow to deep, undifferentiated silt and sand textured, drumlinized and undrumlinized morainal plains characterize much of the remaining parts of the ecoregion.

Soils

Soils of the Big Trout Plains Ecoregion are predominantly Humo-Ferric Podzols and Dystric Brunisols on the drier, well drained sites and Gleysols on imperfectly drained landscape positions such as bedrock depressions and lower slope sites. Orthic Gray and Gleyed Gray Luvisols are associated with the clayey lacustrine deposits. Peaty phase Gleysols and Terric/Typic Fibrisols and Mesisols occur on poorly drained upland sites and wetlands.

Vegetation

Fresh, well drained sites are characterized by stands of black spruce, trembling aspen, and white birch. Drier, rapidly drained sites are more typically characterized by open growth stands of jack pine, aspen, white birch, and black spruce. Black spruce and tamarack commonly occur on poorly drained upland sites and on Organic soils. On variably drained, wet silty and sandy sites, stands of black spruce and tamarack with white spruce, balsam fir, and trembling aspen are found. On variably drained wet to dry silty and sandy sites, black spruce-jack pine and black spruce-tamarack stands are common.

Land Use/Settlement

The ecoregion is sparsely settled, the major settlement being at Big Trout Lake. Forest access roads are only now reaching the area and little economic activity occurs. The ecoregion incorporates three ecodistricts, 59 to 61.

BERENS PLAINS ECOREGION

Climate

Warm summers and cold winters characterize this ecoregion. The mean annual temperature in the southern section of the ecoregion is 1.6°C at Dryden, which is warmer than in the north at Red Lake where the mean annual temperature is 0.7°C. Months when the temperature is above 0°C extend from April to October. Total annual precipitation varies significantly across the ecoregion. In the south, annual precipitation averages 720 mm, whereas in the north it is 588 mm. Distribution of moisture throughout the year is uneven with rainfall more than twice that of snowfall in all parts of the ecoregion. In southern sections, total monthly rainfall during the May to September period typically ranges from 70 to 100 mm. In northern areas, rainfall for a similar period ranges from 50 to 85 mm. Winter snowfall ranges in all sections of the ecoregion from 30 to 45 mm per month.

Terrain

The western area of the ecoregion is characterized by weakly to moderately broken plains, with bare to shallow soils over bedrock. Pockets of frequently peat-covered, thin clay deposits are found in most valleys and depressions. Shallow sandy to silty sandy moraine covers many of the ridges. To the north in the Lac Seul area, the ecoregion is characterized by weakly broken bedrock ridges, covered by shallow silty sands. A large, weakly broken, varved lacustrine clay plain immediately surrounding Lac Seul dominates the central area. Extensive peat deposits are found in the northern sections of this clay plain. The remaining areas in the ecoregion are characterized by weakly to moderately broken shallow moraine over bedrock, and shallow moraine over bedrock with pockets of lacustrine clay sediments. Lacustrine sediments were deposited as part of Glacial Lake Agassiz.

Soils

Dry to fresh, well drained sandy sites are typically characterized by Ferro-Humic Podzols or Dystric Brunisols. Gleyed phases of these soils can also occur on similar parent materials in moist or wet landscape positions. Brunisolic Luvisols and Gray Luvisols are typically found on fresh sites, along with clayey Gleyed Luvisolic soils on moist to wet clay sites. Bedrock sites are characterized by shallow Folisolic soils. These sites, which frequently are characterized by only a

trace of mineral soil, have 10 to 20 cm-thick organic mats and are extremely sensitive to disturbance. When destroyed by fire or forest harvesting, exposure of bare bedrock results. Deep Organic soils are found in many bedrock depressions and range from Fibrisols to Humisols. On shallow peat sites, peaty phase or Humic Gleysols commonly occur.

Vegetation

On well drained, fresh, loamy to silty and clayey sites, mixed stands of trembling aspen and white birch commonly occur following disturbance. White spruce, black spruce, balsam fir, and, occasionally, eastern white pine succeeds .he early, seral hardwood stands. On dry, rapidly drained sites, jack pine typically follows disturbance by fire. Imperfectly drained, fine textured sites support stands of balsam poplar, eastern white cedar, and tamarack. Organic soils are typically dominated by black spruce, and tamarack; however, black ash and white elm also occur in the ecoregion on these sites. Eastern white pine and red pine occur on warmer site positions throughout the area.

Land Use/Settlement

Forestry and tourism are the predominant economic activities in the ecoregion although gold mining (Red Lake) and iron ore (Bruce Lake) are also important activities. Red Lake, Dryden, and Sioux Lookout are the largest communities in this otherwise sparsely populated region. Three ecodistricts, 56 to 58, are incorporated in this ecoregion.

LAKE OF THE WOODS PLAINS ECOREGION

Climate

Warm summers and cold winters characterize this ecoregion. A mean annual temperature representative of the ecoregion is 2.1°C at Kenora, where mean daily temperatures above 0°C occur during the period from April to October. Annual precipitation averages 623 mm, most of which falls as rain during May to September. Monthly precipitation during this period ranges from 57 to 91 mm, whereas during the remainder of the year precipitation ranges from 23 to 40 mm.

Terrain

The northern section of the Lake of the Woods Plains Ecoregion is characterized by moderately to weakly broken topography with bare, wave-washed bedrock ridges or shallow, loamy to silty textured sands. Shallow to deep silty clays occur in valleys and depressions. The sandy morainal material is typically very

bouldery and consists of a surface ablation moraine, occasionally overlaying a compact basal moraine. Pockets of deep, well drained glaciofluvial or lacustrine sands occur throughout the ecoregion. The Rainy River area is characterized by very weakly broken clay plains, frequently covered by peatlands. The clay, deposited when the area was part of Glacial Lake Agassiz, is highly calcareous in the western sections of the area, becoming less so towards the east. Scattered, bedrock ridges occur in the eastern section of the area, but are most frequent towards the north.

Soils

Fresh, well drained, coarse textured sites are characterized by Humo-Ferric Podzols or Dystric Brunisols, with gleyed phases occurring on the moist and wet landscape positions. Shallow soil sites are characterized by Typic Folisols with organic (feathermoss) litter layers of variable thickness. Fresh, well drained sites with finer textured silts and clays are typically Gray Luvisols and Brunisolic Gray Luvisols. On similar textured soils in wetter landscape positions, Gleyed Luvisols or Humic Gleysols are common. Peaty phase Gleysols and deep Fibrisols, Mesisols, and Humisols are associated with poorly drained depressions and organic sites. Peats are usually deep (up to 10 to 15 m in depth).

Vegetation

Vegetation of the Lake of the Woods Plains Ecoregion shows a transitional character between the southern hardwood dominated areas and the northern coniferous boreal forest. Site disturbance plays an important role in determining the composition of the vegetation. Jack pine typically occurs on well drained, coarser textured soils, and on very shallow soils, particularly following fire. Black spruce also occurs on such sites, but more typically following forest harvesting. Mixed stands of trembling aspen, white birch, black spruce and balsam fir occur over a range of site conditions. On wet, poorly drained sites, black spruce and tamarack are the most frequently occurring species. Occasional stands or occurrences of white and red pine, basswood (<u>Tilia americana</u>), red maple, Manitoba maple (<u>Acer negundo</u>), and bur oak (<u>Quercus macrocarpa</u>) are found on better drained sites throughout the region. White elm, black ash, and balsam poplar occur on poorly drained sites throughout but are most frequent in southern sections of the ecoregion.

Land Use/Settlement

Forestry and tourism are the most important economic activities of this ecoregion. In the Rainy River area, farming is locally important but generally declining. Most of the ecoregion is accessible by road (usually logging roads) - an important consideration in development of the tourism industry. Kenora and Fort Frances are the two major population centres of the ecoregion. The ecoregion incorporates three ecodistricts, 53 to 55.

GODS PLAINS ECOREGION

Climate

Cool summers and long cold winters are characteristic of this ecoregion. A mean annual daily temperature of -2.1°C at Island Lake, Manitoba is representative with mean daily temperatures exceeding 0°C from May to October. The mean daily January temperature at Island Lake is -24.8°C and the mean daily July temperature is 17.1°C. The mean annual precipitation at Island Lake is 567 mm.

Terrain

The Gods Plains Ecoregion, most of which occurs in Manitoba, has a gently undulating to hummocky veneer of shallow to deep, moderately calcareous lacustrine clay deposits. Occasional Canadian Shield bedrock outcrops occur. Scattered sites have washed and eroded materials over bedrock. Shorelines are generally irregular and rocky. Local elevations range from 180 to 240 m above sea level. Organic landforms include peat plateau and palsa bogs with shallow to deep peat.

Soils

Loamy to sandy textured morainal materials underlie surficial clay textured soils, generally Orthic Gray Luvisols and Eutric Brunisols on wave washed sites. Terric Mesisol and Terric Fibric Organic Cryosols occur in peatlands. All mineral soils are generally weakly to strongly calcareous and well drained. Permafrost is discontinuous in this ecoregion occurring at 60 to 200 cm depth in Organic soils, but only rarely in mineral soils. In poorly drained clays, permafrost is common at a depth of 40 to 100 cm.

Vegetation

This ecoregion mainly has closed coniferous forests. On variably drained, wet silty and sandy sites, stands of black spruce and tamarack with white spruce, balsam fir, and trembling aspen are found.

Land Use/Settlement

The ecoregion is sparsely settled with only a few small centres including Sachigo Lake in Ontario and Island Lake in Manitoba. Hunting and trapping are the main economic activities in this ecoregion. The ecoregion incorporates five ecodistricts, 75 to 79.

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ECOREGIONS AND ECODISTRICTS OF ONTARIO: SUMMARY TABLE

-1787
C26

Government
Publications

Canada

ECOREGION NAME	ECODISTRICT NUMBER	AREA (SQ KM)	ELEVATION (MEAN) (M)	MACRORELIEF	LAND WATER RATIO	LANDFORM DESCRIPTION	BARE ROCK SOIL RATIO	BEDROCK TYPE	CONSOLIDATED SURFACE EXPRESSION	SOIL BASE SATURATION	SOIL TEXTURE	SOIL DEPTH	UNCONSOLIDATED SURFACE EXPRESSION	SOIL GREAT GROUP	SOIL PETROGRAPHY	SOIL DRAINAGE CONDITION	PARENT MATERIAL	PRIMARY VEGETATION COVER	SECONDARY VEGETATION COVER	TERTIARY VEGETATION COVER	DRAINAGE DENSITY	LAKE SIZE	LAKE EXPRESSION	RIVER SIZE	RIVER EXPRESSION	ECOREGION NAME
ERIE	1	13480	174-302(229)	VW	100 0	BEVLD GM/SAN	0 100	LIMST SHALE DOLOM	L	HIGH	CLY CMX LOM	DEEP	L	HGL GBL	H/M LIME	F, W	O, F, L	BE, MA, OA	SB, LA, CE	—	SPA	NIL	N/A	SMA, MED	DEND, PARA	ERIE
	2	2500	174-376(229)	W M	100 0	SA/PLN	0 100	LIMST DOLOM SHALE GYPSM	L	HIGH	SMX FIN SND LMX	DEEP	U	GBL	H/M LIME	D	F, O, L	BE, MA, BO, OA	—	—	MOD, DEN	NIL	N/A	SMA	DEND	
	3	4340	174-284(271)	W VW	100 0	CL/PLN	0 100	LIMST DOLOM SHALE GYPSM	L	HIGH	CLY CMX SMX	DEEP SHAL	U	GBL, HGL	H/M LIME	F, W	L, F, O	BE, MA, BO, OA	SB, LA, CE	—	MOD, SPA	NIL	N/A	SMA, MED	DEND, PARA	
	4	6973	75-353(91)	W, M	100 0	BEVLD DRUML GM/PLN	0 100	SHALE LIMST DOLOM SANST	U	HIGH	CLY, LMX, SMX	DEEP	U, M	GBL	M/H LIME	D, F	O, L	BE, MA, OA	—	—	MOD	NIL	N/A	SMA	PARA, DEND	
HURONTARIO	5	3780	317-374(354)	W VW	100 0	BEVLD GM/PLN	0 100	SANST ARKOS LIMST DOLOM	L	HIGH	CLY CMX SMX	DEEP	U, M	GBL, HGL	M/L LIME	F, W	O, F, L	MA, BE, AW, OA	BL, MA, EM	CE	MOD, DEN	NIL	N/A	SMA	PARA	HURONTARIO
	6	1190	213-332(244)	W VW	75 25	GM/LIM ESCRT	0 100	SHALE LIMST DOLOM SANST	L, S	HIGH	LMX CMX, HUM	SHAL, DEEP	U	MBR, GBL, HUM	VH LIME	F, W	O, O, L	MA	—	—	SPA	MED VLR	MULT, ELON	SMA	PARA	
	7	3030	183-566(355)	M W	100 0	SA/PLN GM/PLN ESCRT	0 100	LIMST SHALE DOLOM SANST	T	HIGH	CMX SMX	DEEP	M, U	MBR, GBL	M/VH LIME	F	L, O, F	MA, BE AW OA	BL, MA, EM	—	SPA	NIL	N/A	SMA	ANGU	
	8	6340	264-546(355)	W M	100 0	DRUML GM/PLN	0 100	DOLOM LIMST SILST SANST	L	HIGH	LMX SMX HUM	DEEP	M, U, R	GBL MBR, HUM	M/VH LIME	VP	O, F, O	MA, BE, OA, AW, HE	BL, OA, AW, HE	EM, MA, CE	MOD	MED	IRRG, ROUN	SMA	DEND, ARTF	
	9	4560	305-488(366)	W VW	100 0	GM/PLN	0 100	LIMST DOLOM SHALE GYPSM	L	HIGH	CLY CMX	DEEP	U, R	GBL, HGL	M/L LIME	F	O, F	MA, BE, AW, OA	BL, MA	CE	MOD, DEN	MED	ELON	SMA	TREL, ANGU	
	10	1640	305-370(320)	W	100 0	SA/PLN	0 100	LIMST DOLOM SHALE GYPSM	L	HIGH	LMX SMX	DEEP	U	GBL	M/L LIME	D, F	L, F, G	BE, MA, AW, OA	BL, MA, EM	CE	MOD	MED	MULT	SMA, MED	DEND	
	11	7946	347-573(457)	W M	100 0	DRUML GM/PLN	0 100	DOLOM LIMST SILST SHALE	L	HIGH	LMX, SMX LOM	DEEP	M	GBL	M/L LIME	F, D	O, F	MA, BE, AW, OA	BL, MA, EM	CE	MOD, DEN	SMA	MULT	SMA, MED	DEND	
	12	6973	183-424(305)	W, M	90 10	DRUML GM/PLN SA/PLN	0 100	LIMST SHALE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	O, F, L	MA, BE, AW, OA	BL, MA, EM	CE	MOD, SPA	MED	ROUN	SMA	DEND	
	13	14320	75-408(205)	W, M	80 20	BEVLD DRUML GM/PLN	10 90	LIMST SHALE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	O, L	MA, BE, AW, OA	BL, MA, EM, CE	—	MOD, SPA	VLR, SMA	IRRG, ELON	SMA, MED	TREL, DEND	
HUDSON PLAINS	69	17520	[illegible]	VW	[illegible]	MA/PLN OR/TER	[illegible]	DOLOM, LIMST SILST SANST	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SW, SB	—	MOD	SMA	ELON, ROUN	LAR, SMA	DERA, BRAI	HUDSON PLAINS
	71	[illegible]	[illegible]	VW	[illegible]	MA/PLN OR/TER	[illegible]	DOLOM, LIMST SILST SANST	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SW, SB	—	MOD	SMA	ELON ROUN	LAR, SMA	DERA, BRAI	
GODS PLAINS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SB, LA	SW, BF, PO	MOD, DEN	MED, VLR	ELON, MULT	SMA, MED	RECT, DERA	GODS PLAINS
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SB, LA	SW, BF, PO	MOD, DEN	MED, LAR	IRRG	SMA	DERA, TREL	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SB, LA	SW, BF, PO	MOD, DEN	MED, LAR	IRRG	SMA	DERA, TREL	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SB, LA	SW, BF, PO	MOD, DEN	MED, LAR	IRRG	SMA	DERA, TREL	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SB, LA	SW, BF, PO	MOD, DEN	MED, LAR	IRRG	SMA	DERA, TREL	

TABLE TO ACCOMPANY MAP ENTITLED "TERRESTRIAL ECOREGIONS AND ECODISTRICTS OF ONTARIO" BY G.M. WICKWARE AND C.D.A. RUBEC (1989). SUSTAINABLE DEVELOPMENT BRANCH, ENVIRONMENT CANADA, OTTAWA.

ECODISTRICT DESCRIPTIONS LEGEND

ÉCORÉGIONS ET ÉCODISTRICTS TERRESTRES DE L'ONTARIO: TABLEAU DESCRIPTIF

LÉGENDE DES DESCRIPTIONS DES ÉCODISTRICTS

TABLEAU À ACCOMPAGNER LA CARTE INTITULÉE « ÉCORÉGIONS ET ÉCODISTRICTS TERRESTRES DE L'ONTARIO », PAR G.M. WICKWARE ET C.D.A. RUBEC (1989). DIRECTION DU DÉVELOPPEMENT DURABLE, ENVIRONNEMENT CANADA, OTTAWA.

PET, GRD	MULT, IRRG	PET	DEND	PLAINES DE THUNDER BAY
GRD, MOY	IRRG	PET	ANGU	
ALC	S/O	PET	DEND	PLAINES DU LAC DES BOIS
VAR, MOY	IRRG, ALON	PET	DEND	
VAR, MOY	IRRG	PET	ANGU	
GRD, TGR	IRRG	PET	ANGU	PLAINES DE BERENS
MOY, GRD	IRRG, ALON	PET	ANGU, DEND	
VAR, PET	IRRG, MULT	PET	ANGU	
VAR, TGR	MULT, IRRG	PET, MOY	DEND, DERA	PLAINES DU BIG TROUT LAKE
MOY, TGR	ALON, MULT	PET, MOY	RECT, DERA	
VAR, MOY, GRD	ALON, IRRG	PET	RECT	
PET, MOY	ALON	PET	PARA	PLAINES DE SPECTOR
MOY	ROND	PET, MOY	DERA, PARA	
PET, GRD	ROND	PET	DERA	
MOY, PET	ROND	MOY, PET	DEND, PARA	
MOY, GRD	MULT, ROND	GRD, PET	DERA, PARA	
PET, MOY	ROND, MULT	PET	DERA	
VAR, PET, MOY	MULT, ROND	PET	DERA	
PET, GRD	ROND, ALON	PET, MOY	DERA, PARA	
MOY, PET	MULT, ROND	MOY, PET	DERA, ANAS	
PET	ALON, ROND	GRD, PET	DERA, ANAS	
PET, MOY	ROND, ALON	MOY, PET	DEND, PARA	
PET, MOY	ROND, ALON	MOY, PET	DEND, PARA	
PET	ALON, ROND	GRD, PET	DERA, ANAS	PLAINES D'HUDSON
PET	ALON, ROND	GRD, PET	DERA, ANAS	
MOY, TGR	ALON, MULT	PET, MOY	RECT, DERA	PLAINES DE GODS
MOY, TGR	IRRG	PET	DERA, TREL	
MOY, GRD	IRRG	PET	DERA, TREL	
MOY, GRD	IRRG	PET	DERA, TREL	
MOY, GRD	IRRG	PET	DERA, TREL	

ÉGIONS ET ÉCODISTRICTS TERRESTRES DE L'ONTARIO", PAR G.M. WICKWARE ET C.D.A. RUBEC (1989).
IENT CANADA, OTTAWA.

RELATIVE DE TERRE ET D'EAU DANS L'ÉCODISTRICT, EXPRIMÉE EN POURCENTAGE DE LA SUPERFICIE. PAR EXEMPLE, 75:25 SIGNIFIE 75 % DE TERRE ET 25 % D'EAU. UNE VALEUR DE 100:X INDIQUE QUE LA PRESQUE TOTALITÉ DE L'ÉCODISTRICT EST DÉPOURVUE DE LACS.

FORME DE RELIEF

DESCRIPTION GÉOMORPHOLOGIQUE DES FORMES SUPERFICIELLES DU PAYSAGE DANS L'ÉCODISTRICT.

AR/PLN — PLAINE AVEC DÉPÔTS PLATS À TEXTURE ARGILEUSE
BISET — SURFACE BISEAUTÉE
DISCN — DISCONTINU
DPSPF — PLACAGE DE DÉPÔTS SUPERFICIELS (MOINS DE 1 M DE PROFONDEUR)
DRUML — DRUMLINES
CARBN — DÉPÔTS RICHES EN CARBONATES
ESCRT — ESCARPEMENT
GLACM — MORAINE GLACIAIRE
MA/PLN — PLAINE AVEC DÉPÔTS MARINS
MG/PLN — PLAINE AVEC DÉPÔTS MORAINIQUES GLACIAIRES
MO/TER — MORAINE TERMINALE
OR/TER — TERRAIN AVEC SOLS ORGANIQUES
RO/CRT — CRÊTES ROCHEUSES
SA/PLN — PLAINE AVEC DÉPÔTS SABLEUX

RAPPORT ROCHE: SOL

POURCENTAGES RELATIFS D'ASSISE ROCHEUSE EXPOSÉE ET DE TERRES RECOUVERTES DE SOL (À L'EXCLUSION DES TERRES RECOUVERTES D'EAU), EN TERMES DE SUPERFICIE, DANS L'ÉCODISTRICT. PAR EXEMPLE, 10:90 SIGNIFIE 10 % DE ROCHE DÉNUDÉE ET 90 % DE TERRE RECOUVERTE DE SOL.

TYPE DE ROCHE EN PLACE

PRINCIPALES VENUES DE ROCHE EN PLACE SOUS-JACENT OU EXPOSÉE DANS L'ÉCODISTRICT.

ARKOS — ARKOSE
BASLT — BASALTE
CALCR — CALCAIRE

P — PLAT
T — TERRASSÉ
V — VALLONNÉ

GRAND GROUPE DE SOLS

GRAND GROUPE DE SOLS, TEL QUE DÉFINI DANS LE SYSTÈME CANADIEN DE CLASSIFICATION DES SOLS (COMITÉ CANADIEN DES RELEVÉS PÉDOLOGIQUES, 1978).

BDY — BRUNISOL DYSTRIQUE
BEU — BRUNISOL EUTRIQUE
BME — BRUNISOL MÉLANIQUE
COR — CRYOSOL ORGANIQUE
FIB — FIBRISOL
GHU — GLEYSOL HUMIQUE
GLY — GLEYSOL
HUM — HUMISOL
LGB — LUVISOL GRIS-BRUN
LGL — LUVISOL GLEYIFIÉ
LGR — LUVISOL GRIS
MES — MÉSISOL
PHF — PODZOL HUMO-FERRIQUE

PÉTROGRAPHIE DU SOL

TENEUR RELATIVE EN CARBONATES DES SOLS DE L'ÉCODISTRICT.

FB — DES AUTRES BASES AUTRES QUE LES CARBONATES SONT PRÉSENTS, FAIBLE
E — CARBONATES, ÉLEVÉE
F — CARBONATES, FAIBLE
M — CARBONATES, MOYENNE
NOCR — LES SOLS NE CONTIENNENT PAS DE CARBONATE
TFB — DES BASES AUTRES QUE LES CARBONATES SONT PRÉSENTS, TRÈS FAIBLE
TE — CARBONATES, TRÈS ÉLEVÉE
TF — CARBONATES, TRÈS FAIBLE

CONDITION DU DRAINAGE DU SOL

RÉGIME D'HUMIDITÉ DU SOL SUPERFICIEL TYPIQUE DES CONDITIONS PRÉVALANT AU MILIEU DE LA SAISON DE VÉGÉTATION.

F — FRAIS
H — HUMIDE
S — SEC
TF — TRÈS FRAIS
TH — TRÈS HUMIDE
TS — TRÈS SEC
VA — VARIABLE
X — INCONNU

ALON — ALLONGÉS
IRRG — IRRÉGULIERS
MULT — MULTIPLES
ROND — RONDS
S/O — SANS OBJET

TAILLE DES RIVIÈRES

TAILLE MOYENNE DE LA PLUPART DES RIVIÈRES OU RUISSEAUX COMMUNS DE L'ÉCODISTRICT EN TERMES DE LARGEUR ET DE DÉBIT GLOBAL.

GRD — GRANDES (DE 50 À 500 M DE LARGEUR)
MOY — MOYENNES (DE 10 À 50 M DE LARGEUR)
PET — PETITES (MOINS DE 10 M DE LARGEUR)
TGR — TRÈS GRANDES (PLUS DE 500 M DE LARGEUR)
VAR — VARIABLES

TRACÉ DES RIVIÈRES

FORME DES RIVIÈRES ET DES RUISSEAUX DANS LE PAYSAGE.

ANAS — ANASTOMOSÉES
ANGU — ANGULEUSES
ARTF — ARTIFICIELLES
DEND — DENTRITIQUES
DERA — DÉRANGÉES
PARA — PARALLÈLES
RECT — RECTANGULAIRES
TREL — EN GRILLAGE

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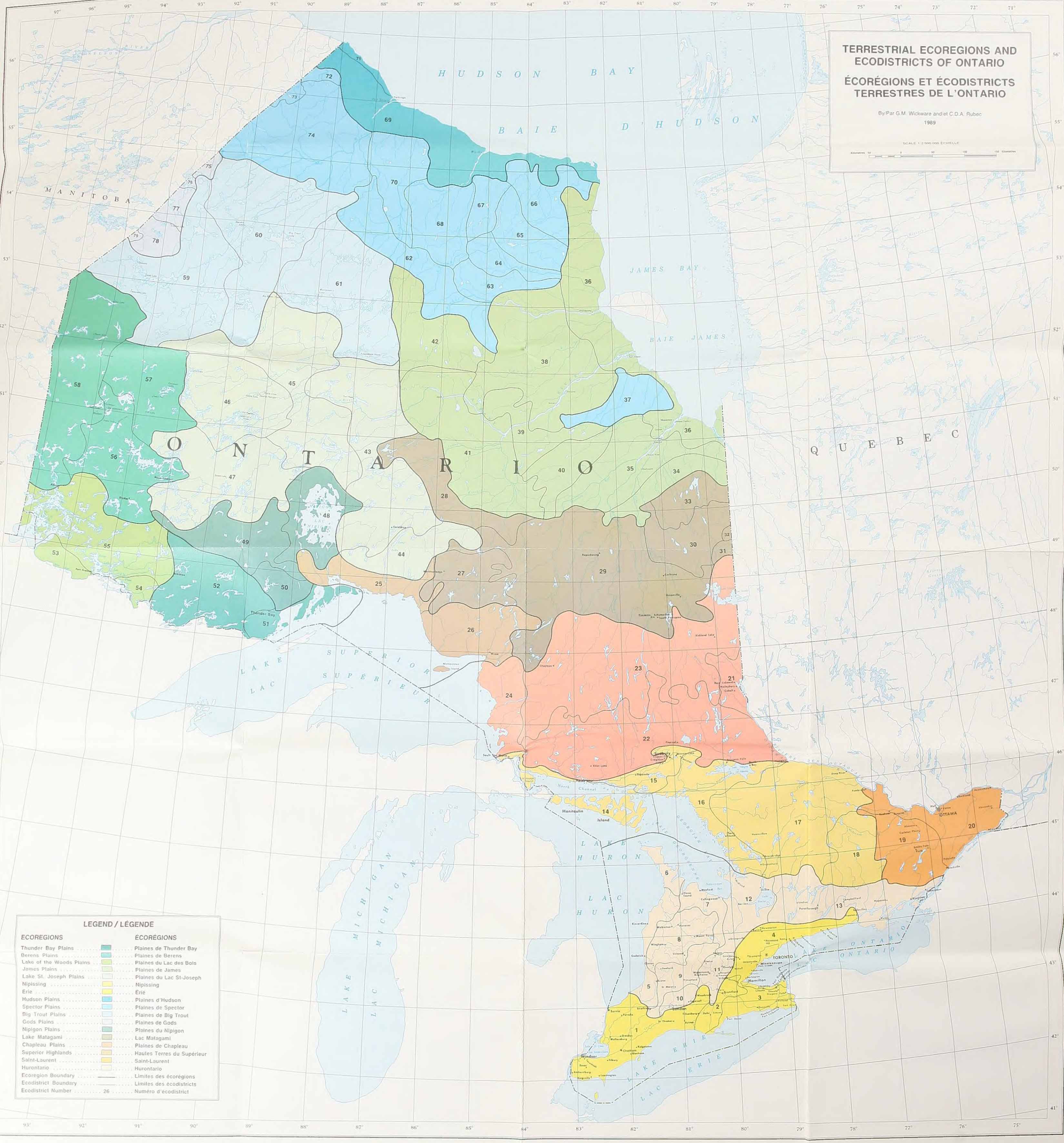


48°
47°
Rivière
St-Maurice
Réservoir
Gouin
Réservoir
Cabonga
Outaouais